No. 8. — *A Supplement to the Fifth Volume of the Terrestrial Air-Breathing Mollusks of the United States and Adjacent Territories.*

By W. G. Binney.

The following pages embody all the additional information relating to the subject which I have been able to obtain since the publication in the Bulletin of the Museum of Comparative Zoölogy, Vol. IV., of the fifth volume of the Terrestrial Air-Breathing Mollusks of the United States.

Burlington, New Jersey, July, 1883.

In the chapter on Geograpical Distribution several additions and corrections are to be made.

On p. 18 to the first list add: —

Onchidium Carpenteri.

The species are said to range over the *whole* of the Pacific Province. Some of them are only coast range species in California, not being found in the Sierra Nevada.

On p. 19 to the second list add: —

Macrocyclis Hemphilli.
Onchidium borealis.

In the Californian Region (p. 19), the range of the species is limited, as shown in the descriptive portion of the work. Most of the species are confined to the vicinity of the coast; as, —

Macrocyclis Voyana.
Duranti.
Limax Hewstoni.
Ariolimax niger.
Hemphilli.
Andersoni.
Aglaia infumata.
Arionta arrosa.
exarata.
Arionta Nickliniana.
Californiensis.
Traski.
Carpenteri.
sequoicola.
Dupetithouarsi.
Diabloensis.
Stearnsiana.
Euparypha Tryoni.

Glyptostoma Newberryanum.
Pupa Rowelli.
Californica.
Onchidium Carpenteri.
Veronicella olivacea.

Still as coast species, but confined to islands, are: —

Arionta intercisa.
Ayersiana.
Kelletti.
Arionta ruficincta.
Gabbi.
Binneya notabilis.

In the Sierra Nevada are found: —

Vitrina Pfeifferi.
Zonites Whitneyi.
chersinellus.
Gonostoma Yatesi.
Polygyra Harfordiana.
Aglaia Hillebrandi.
Arionta Mormonum.

Both in the coast counties and Sierra Nevada are found: —

Ariolimax Californicus.
Triodopsis loricata.
Arionta tudiculata.

The last species near the coast only between San Buenaventura and San Diego.

Pupa corpulenta is incorrectly referred in the lists to the Pacific rather than Central Province.

On p. 21, in the first list add: —

Macrocyclis Hemphilli.

In the second: —

Onchidium Carpenteri.

To the list on p. 22 add: —

Onchidium Carpenteri.
borealis.
Macrocyclis Hemphilli.

And omit *Pupa corpulenta*, a species restricted to the Central Province. This last species is to be added to the list on p. 24.

To the list on p. 33 add: —

Zonites petrophilus.
Wheatleyi.
Rugeli.
Lawi.
cuspidatus.
Zonites macilentus.
Andrewsi.
Patula Bryanti.
Helicodiscus fimbriatus.
Mesodon Andrewsi.

To the list on p. 37 add: —

Triodopsis Levettei.
Triodopsis Copei.

Glandina truncata, GMELIN. (p. 84.)

Found also in North Carolina.

Glandina Texasiana, PFEIFFER. (p. 87.)

Found also in Louisiana.

Macrocylis Voyana, NEWCOMB. (p. 93.)

A smaller variety of 9 mm. greater diameter is found at Los Angeles.

Macrocylis Hemphilli, W. G. BINN.

Plate II. Fig. M.

At Olympia, Oregon, Mr. H. Hemphill collected several specimens of a *Macrocyclis*, which appears to be distinct from, though nearly allied to, *M. Vancouverensis*. It may be best described by saying that

The umbilicus is narrower and not excavated so much, the termination of the last whorl not receding from the umbilicus as in all the forms of *Vancouverensis* and *concava;* in all, the whorls are more or less strongly striated within the umbilicus, often almost ribbed in *concava;* not so in this shell; the texture of the shell is glassy like *Hyalina*, and there is no trace of the microscopic spiral lines found in all the other forms; beneath, the last whorl is proportionately wider. The greater diameter is 14 mm.; lesser, 10; height, 5.

The jaw and lingual dentition are as usual in the genus. I could not distinguish the characters of the central tooth in this species.

Zonites capnodes, W. G. BINN. (p. 98).

Plate III. Fig. C.

Living specimens received from near Knoxville, Tenn., through the kindness of Mrs. George Andrews, have enabled me to figure the genitalia. The genital bladder (*g. b.*) is large, globular, on a short, narrow duct: the penis-sac (*p. s.*) has the same peculiar accessory process which I have detected in those of *Z. lævigatus*, *Rugeli*, *fuliginosus*, *friabilis*, and *inornatus*. There is a vaginal prepuce.

It is in many individuals more easy to distinguish *capnodes* from *fuliginosus* by the dentition than by the shell.

Zonites fuliginosus, GRIFF. (p. 100.)

In a specimen from Indiana, sent me by Mr. F. Stein, I find the same accessory process to the penis-sac noticed above. It is not given in Leidy's figure in Vol. I.

Zonites Rugeli W. G. Binn.

Plate II. Figs. H, I. Plate III. Fig. D.

Shell depressed globose, perforated, thin, delicately wrinkled, the apical whorls sometimes striate, greenish horn-colored, dark smoky above; spire slightly elevated, apex flat; whorls 6, slightly rounded, the last globose, scarcely excavated at the perforation; aperture large, rounded, oblique; peristome simple, thin; ends slightly approaching; the columellar one scarcely broadened. Diameter, larger, 19 mm.; lesser, 15 mm.; height, 9 mm.

Zonites Rugeli, W. G. Binn., Ann. N. Y. Acad. Sci., Vol. I. No. 2, p. 357, Pl. XV. Fig. H, Pl. XIV. Fig. D, 1879.

Roan Mountain, Mitchell Co., North Carolina. Mrs. George Andrews.

When first received, I believed this to be an extremely globose form of *Z. inornatus*, but an examination of the lingual dentition showed this to be impossible.

I have given a figure of the genitalia. It will be seen that the accessory part of the penis-sac is in this species continued to a point beyond the retractor-muscle: otherwise the genitalia are very similar to these of *capnodes*, *friabilis*, *inornatus*, *lævigatus*, and *fuliginosus*.

Jaw as usual in the genus. Lingual membrane as usual: teeth 38–1–38. There are about 4 or 5 laterals; the 8th is a pure marginal on either side of the central line. It will be seen that *inornatus*, *subplanus*, and *lævigatus* are peculiar in having no perfect lateral teeth, but only transition teeth: *fuliginosus*, *capnodes*, and *friabilis*, as well as *Rugeli*, have well-formed laterals, differing in number in the various species: thus the lingual dentition in this group is a good guide in distinguishing the species.

The animal is dark slate-colored: the caudal mucus-pore is a longitudinal slit, as in *suppressus*.

Some individuals have their apical whorls striate, as in *Z. subplanus.*

Zonites lævigatus, Pfeiffer. (p. 102.)

The caudal mucus-pore seems to be round, and not a simple longitudinal slit as in *Z. capnodes*, *friabilis*, *fuliginosus*, *Rugeli*, and *inornatus*.

The globose variety shares with the type the peculiar lingual dentition.

Zonites demissus, Binney. (p. 104.)

Found also at Cedar Keys, Florida, and Texasana, Texas.

From the mountains of North Carolina and Tennessee I have received a gradual series of size from the typical *demissus* to *acerrus*.

Zonites intertextus, BINNEY. (p. 106.)

I have received it from Texas.

Zonites subplanus, BINNEY. (p. 107.)

Plate II. Fig. J.

This rare species has lately been found on Roan Mountain, Mitchell Co., North Carolina, by Mrs. George Andrews.

The dentition (see plate) is the same as in *Z. inornatus.*

The shell from Roan Mountain is very dark, almost black. Wyoming Co., Pennsylvania (J. S. Phillips).

Zonites sculptilis, BLAND. (p. 109.)

Found also at the mouth of Laurel River, Wilby Co., Kentucky (A. G. Wetherby).

Zonites cerinoideus, ANTHONY. (p. 111.)

Zonites cuspidatus, Lewis, is a variety of *Z. gularis,* or a distinct species. See below, p. 143.

Zonites cellarius, MÜLLER. (p. 111.)

St. Louis (L. B. Case).

Zonites Whitneyi, NEWCOMB. (pp. 113, 432.)

Plate III. Fig. L.

The dentition is figured on the plate referred to.

Zonites viridulus, MENKE. (p. 115.)

Portland, Oregon (H. Hemphill).

Zonites indentatus, SAY. (p. 116.)

To the synonymy add : —

Hyalina subrupicola, DALL, Bull. U. S. Geol. and Geogr. Survey of the Territories, Vol. III. No. 1, p. 163, Fig., April, 1877.

A copy of Dr. Dall's description and figure are here given (the latter on Pl. IV. Figs. H, I) : —

Of the following species, described by Mr. W. H. Dall, several examples occurred. Specimens were sent to Mr. W. G. Binney, who regards it as "apparently an albino variety of *Zonites indentata*." Specimens were submitted to Prof. J. S. Morse, who judged it to be quite distinct from *Z. indentata*. Other specimens were sent to Mr. Dall, who describes it as a new species, and has kindly prepared the following notice.

HYALINA SUBRUPICOLA, n. sp. (Fig. 7).

This little shell is best described by a comparison of its various characteristics with those of *H. indentata*, Say, as given by Mr. Binney in his Land and Fresh-water Shells of the United States (Part I. p. 35).

H. subrupicola, while exhibiting radiating lines of growth, some of which are more conspicuous than others, does not show any such well-marked grooves or indentations as are figured by Morse (Land Shells of Maine) in *indentata*, and which form its most striking character. The former has five and a half whorls, with a greatest diameter in the largest specimen of 0.14 inch, while *indentata* has but little more than four, with a diameter of 0.20 inch. The former is perfectly pellucid, while the latter has a peculiar whitish spermaceti-like lustre. *H. subrupicola* has the last whorl smaller proportionally than *indentata*, and in fact the increment of the whorls in the former is much more regular and even. The umbilicus in both is precisely similar.

The animal of *subrupicola* varies from whitish to slaty ; the granules of the upper surface of the foot are remarkably coarse and well marked. The tentacles are, as contracted in alcohol, hardly perceptible ; the eye-peduncles are from the same cause not extended, but appear to be as usual in the genus, and to possess normal ocular bulbs. The office filled by these, however, being quite as much of a tactile nature as for purposes of sight, the usual rule in regard to the blindness of most cave animals does not apply in the case of the *Helicidæ*. With the exception of *H. indentata*, this species does not seem very near to any of the described American species, and it is totally dissimilar to *Ammonitella Yatesii*, J. G. Cooper, a remarkable form found in caves in Calaveras County, California.

Hab. — Cave in Utah. Collected by Dr. A. S. Packard, Jr., of Dr. Hayden's Survey.

It may be noted that *H. indentata* does not appear to have been collected west of the Rocky Mountains.

Zonites petrophilus, BLAND.

Plate I. Fig. F.

T. late umbilicata, depresso-subglobosa, tenuis, nitens, translucens, albida, irregulariter striata ; sutura mediocris ; anfr. 5½–6, convexiusculi, ultimus convexior, non descendens ; umbilicus extus late excavatus, perspectivus ; apertura rotundato-lunaris ; peristoma simplex, paululo subincrassatum, sæpe roseum, margine columellari reflexiusculo.

Shell broadly umbilicate, depressed; subglobose, thin, shining, translucent, whitish, irregularly striated; suture moderately impressed; whorls 5½–6, rather convex, the last more convex, not descending; umbilicus widely excavated externally, pervious; aperture roundly lunate; peristome simple, somewhat thickened, often rose-colored, the columellar margin slightly reflected. Diameter, greater, 6mm.; lesser, 5–5¼ mm.; height, hardly 3 mm.

Zonites petrophilus, BLAND, Ann. N. Y. Acad. Sci., Vol. II., Fig., p. 369 (1883).

The Cliffs, Knoxville, Tennessee, found with *Z. Wheatleyi*, Mrs. George Andrews.

This species is, in general form, nearly allied to *Z. arboreus*, but the color is different, the striæ are more developed, and the umbilicus is much wider.

My friend, Mr. W. G. Binney, examined the dentition of *Z. petrophilus*, and favored me with notes on the subject. He found the teeth 15–1–15, with two perfect laterals, one only on each side. *Z. viridulus* has the same number of laterals, but many more marginals.

I would express my deep obligation to Mrs. Andrews for her uniform kindness and liberality in supplying me, during many years, with numerous rare and interesting species. (Bland.)

Fac-similes of the original figures are given on Pl. I. Fig. F.

Zonites Wheatleyi, BLAND.

Plate I. Fig. G.

T. umbilicata, depressa, tenuis, nitens, pellucida, fusculo-cornea, delicata striatula; spira subplanulata; sutura leviter impressa; anfr. 4½, convexiusculi, ultimus basi convexior, ad aperturam rapide accrescens, vix descendens; umbilicus pervius; apertura depressa, oblique lunaris; peristoma simplex, acutum, marginibus approximatis, callo tenui junctis.

Shell umbilicated, depressed, thin, shining, pellucid, brownish horn-colored, finely striated; spire subplanulate; suture slightly impressed; whorls little convex, the last more convex at the base, rapidly increasing at the aperture, scarcely descending; umbilicus pervious; aperture depressed, obliquely lunate; peristome simple, acute, the margins approximating, joined by a thin callus.

Greater diameter, 5 mm.; lesser, 3½ mm.; height, 2 mm.

Zonites Wheatleyi, BLAND, Ann. N. Y. Acad. Sci., Vol. II. p. 368, Fig. 1 (1883).

The Cliffs, Knoxville, Tennessee, Mrs. George Andrews; also, Tiverton, Rhode Island, J. H. Thomson.

This, with the following species (*petrophilus*), was discovered and communicated to me, in 1879, by Mrs. Andrews, who thus described the locality in which the two species were found: "The Cliffs rise up 200 feet on the south side of the river; they are very steep and rocky, face the north, are almost always shady, damp, and covered with mosses and ferns. I collected the shells on the ledges of the rocks among the dead leaves, at an elevation above the river of about 100 feet. I have not found either of the species in any other locality."

Mr. J. H. Thomson, to whom I submitted specimens, sent to me examples of the same species collected by him, "on a high rocky ledge, covered with old trees, at Tiverton, Rhode Island."

This species, *Z. Wheatleyi*, is more nearly allied to *Z. viridulus*, Menke, than to any other North American form, but differs from it, especially in the form of aperture, in the descending last whorl, and in having a wider umbilicus.

I dedicate the species to the memory of my late valued and lamented friend, Charles M. Wheatley. (Bland.)

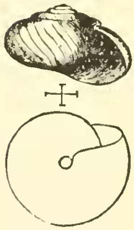
Fac-similes of the original figures are given on Pl. I. Fig. G.

Zonites Binneyanus, Morse. (p. 121.)

Vermont.

Zonites conspectus, Bland. (p. 122.)

Alaska: Salem, Oregon: Merced Co., California (H. Hemphill.)



Zonites chersinellus, Dall. (p. 123.)

Dr. Dall gives the number of whorls 4½–5. A copy of his original figure is here given, as mine is said by him to be incorrect.

Zonites capsella, Gould. (p. 123.)

Lexington, West Virginia; Knoxville, Tennessee (Mrs. George Andrews).

The true *capsella* has 15–1–15 teeth on the lingual membrane, two on each side of the median tooth being true laterals; the fourth is a marginal.

Zonites placentula, Shuttl. (p. 124.)

Plate II. Fig. A.

The description in Vol. V. is a translation of that of Shuttleworth. Fig. 44 in Vol. V. represents *Zonites Lawi* (see below). The true *placentula* is here figured.

Zonites Lawi.

Plate II. Fig. E.

I propose to indicate under the name of *Z. Lawi* the form here figured and formerly considered by me as *Z. placentula*. When the limits of the species in this puzzling group are better understood, a description of *Z. Lawi* may be given.

Zonites placentula, W. G. BINN. (not of Shuttleworth), Terr. Moll. U. S., V. 124, Fig. 44, not description.

Mountains of Tennessee and North Carolina.

There is a variety in which is a heavy internal callus or plate like teeth within the aperture.

This species furnished the lingual membrane described in Vol. V. as that of *Z. capsella.*

Zonites fulvus, MÜLL. (p. 125.)

The dentate form sometimes has radiating rows of teeth, as in *multidentatus.*

Zonites Stearnsi, BLAND. (p. 130.)

This species from the ribbed form of its jaw must be considered a *Microphysa* (see below).

Zonites cuspidatus, LEWIS. (p. 113.)

Plate II. Fig. C.

This form, previously referred by me to a variety of *Z. cerinoideus*, may be considered a distinct species, or a form of *gularis*. It is not a variety of *cerinoideus* (see p. 111). The internal tooth-like processes within the aperture strongly curved one towards the other form almost an arched space. The umbilicus is closed.

Found by Miss Law in Monroe Co., Tennessee; by Mrs. Andrews on Roan Mountain, Mitchell Co., North Carolina.

Zonites macilentus, SHUTTL.

Plate II. Fig. B.

Formerly I referred this to *Z. lasmodon*, but having received specimens from near Shuttleworth's original locality, I am convinced of its being distinct. The original description is given in Vol. III. p. 20.

It is found in the mountains of Tennessee and North Carolina.

Zonites lasmodon, PHILLIPS. (p. 131).

The caudal mucus pore is erect, not the simple longitudinal slit as in *Z. suppressus* (see Fig. on p. 128).

Zonites significans, Bland. (p. 132.)

Plate II. Fig. G.

By an unfortunate mistake another shell is figured on p. 132. That now given correctly represents the species.

Roan Mountain, Mitchell Co., North Carolina (Mrs. G. Andrews).

To synonymy add : —

Hyalina significans, Harper, Journ. Cin. Soc. N. H., Oct., 1881, p. 258, Figs. 2, 2 a.

Zonites multidentatus, Binney. (p. 133.)

Plate II. Fig. F.

For comparison with the last-mentioned and following species an enlarged figure is given.

Zonites Andrewsi, W. G. Binn

Plate II. Fig. D.

The specimen figured was received from Mrs. G. Andrews, who collected it on Roan Mountain, Mitchell Co., North Carolina. It has the general appearance of *Z. significans*, *multidentatus*, and *lasmodon*, but differs so decidedly from each that I propose to designate it by the name of its discoverer. A full specific description can be given later. Compared with *Z. lasmodon*, it has fully 8 whorls, is 6½ mm. in diameter, the umbilicus 1 mm. wide, whilst *lasmodon* with 7 whorls, is 7 mm. in diameter, with an umbilicus 2 mm. wide : the Roan Mountain shell has also five parallel lamellæ, while *lasmodon* has only two, or at most three, and does not show the successive rows of lamellæ which are characteristic of *Andrewsi*, radiating from the centre.

From *Z. significans* it differs in its larger size, greater number of whorls, much wider umbilicus, and in the character of its internal denticles, which are long and winding on the wall of the whorl ; while in *significans* the denticles are simply erect and conical, with broad base. The same differences distinguish it from *multidentatus*, which is still smaller than *significans*, and has a much narrower umbilicus.

Zonites Andrewsi, W. G. Binn., Ann. N. Y. Acad. Sci., Vol. I. No. 2, p. 358, Pl. XV. Fig. D, 1879.

VITRINIZONITES, W. G. Binn.

Plate III. Fig. A.

Animal heliciform, blunt before, in motion greatly acuminated behind : mantle subcentral, protected by an external shell : two longitudinal furrows above the margin of the foot, meeting over a round caudal mucus-pore : distinct locomotive disk to foot : external orifice of combined generative organs on right side of body, far behind the eye-peduncles : of respiratory and excretory organs on the right of the mantle under the peristome : jaw smooth, with median projection : lingual membrane as in *Zonites*, central teeth tricuspid, lateral teeth bicuspid, marginals aculeate.

Shell external, Vitrina-like.

The above generic name is proposed for the shell described as *Vitrina latissima* (p. 136), as it combines the characters of *Vitrina* and *Zonites*. The animal differs from *Vitrina* by having simple, not bifid, marginal teeth to the lingual membrane, and by a caudal mucus-pore, with longitudinal furrows above the margin of the foot, and by the want of an appendiculate mantle. From *Zonites* it differs only in the form of the shell, though the caudal mucus-pore seems to be circular, with projecting process when open, rather than a simple longitudinal slit, as in *Zonites suppressus*. There appears no developed appendiculate mantle process.

The genus in my arrangement will follow *Zonites*.

Vitrinizonites latissimus, Lewis. (p. 136.)

Plate I. Fig. H. Plate III. Fig. A, B.

I here add a figure of the animal in motion (Pl. III. Fig. A), not fully extended, drawn by Miss Emma Pringle. The caudal mucus-pore is circular, bordered with a narrow transversely grooved rim; and when closed is covered completely. When open the cover is raised along its longitudinal centre into a sharp carina, leaving posteriorly, when seen from behind, an erect triangular opening. It thus differs from the simple longitudinal slit found in most of the American species of *Zonites*, such as *friabilis*, *capnodes*, *fuliginosus*, *inornatus*, *demissus*, *ligerus*, *suppressus*, the last figured in Vol. V., Fig. 47. *Z. lævigatus*, however, has a nearer approach to the circular pore of *Vitrinizonites*.

The genitalia are figured on Plate III. Fig. B. The ovary is very large (*ov.*) and stout : the genital bladder (*g. b.*) is globular on a short, narrow duct: the penis-sac (*p. s.*) is very long, narrow, cylindrical, receiving the retractor muscle (*r.*) near its basal termination, and merging at its apex into the vas deferens (*v. d.*). The penis-sac has not the accessory process found in *Zonites capnodes*, *friabilis*, *lævigatus*, *inornatus*, *fuliginosus*, and *Rugeli*.

The species has been found from Carter Co. to Blount Co., Tennessee, on the dividing line between Tennessee and North Carolina.

On Roan Mountain it is usually found under damp moss.

I am indebted to Miss Annie E. Law for the opportunity of examining the specimen figured. She collected it in June, 1879, at the original locality, Bald Mountain, Blount Co., Tennessee, on dividing line with North Carolina. At Washington Co., Tennessee, it was found by Dr. Rugel. Mrs. G. Andrews found it on Roan Mountain, in North Carolina (over 6,000 feet), on the dividing line with Carter Co., Tennessee, and at Thunderhead of Smoky Mountains, North Carolina.

The lingual membrane is broad and not long; the ends are bluntly truncated. There are about 30 rows of 24–1–24 teeth each, arranged as in *Zonites*. There are six laterals, scarcely one perfect, mostly transition teeth, on each side of the central line; the seventh tooth is a marginal; the twelfth tooth is the largest. Plate I. Fig. II, shows all the teeth from the central to the first fully formed marginal, and the two extreme marginals. The dentition is nearest to that of *Zonites lævigatus*.

Limax campestris, Binney. (p. 149.)

An exhaustive paper by E. L. Mark on the Maturation, Fecundation, and Segmentation of this species will be found in Bull. Mus. Comp. Zoöl., Vol. VI. No. 12.

Limax Hewstoni, J. G. Cooper. (p. 150.)

Found by H. Hemphill, from Portland, Oregon, to San Tomas River, Lower California.

Patula solitaria, Say. (p. 156.)

I have seen one specimen from Madison, Indiana, measuring 35 mm. greater diameter.

Patula strigosa, Gould. (p. 157.)

To synonymy add: —

Helix Bruneri, C. F. Ancey, Le Naturaliste, III. p. 468, Sept. 1st, 1881. (Anguispira.)

Diam. maj. 15½ mm.; min. 14 mm.; alt. 7 mm. — Testa sordide alba, pervie lateque umbilicata, utrinque convexa, valde depressa. Spira obtusissima, latissime subconica; anfr. 5, valde convexis; grosse striis incrementi parum regularibus, costisque spiralibus crenulatis, interdum subinterruptis, supra, in anfranctibus primis præsertim, vix distinctis sculpta. Sutura marginata, impressa, subplanulata. Anfr. ult., ad peripheriam carina exserta, non acuta, munitus, costis spiralibus circa 8 subtus intructus. Apertura subemarginato-circularis, obliqua; peristomium simplex, acutum, marginibus callo tenui junctis. Testa colore sordide albo, vittis duabus brunneis ad peripheriam aliquando munita.

Montana (L. Bruner).

Cette espèce, du groupe de *L'Helix* (*Anguispira*) *Cooperi*, W. G. Binney, m'en semble réellement distincte par la carêne très sensible, mais nullement aiguë de son dernier tour, les côtes spirales dont elle est pourvue surtout en dessous, par sa forme beaucoup plus déprimée, également convexe en dessus et en dessous. L'ombilic parait en proportion plus large. *L'Helix Haydeni* Gabb, en diffère par ses côtes spirales mieux marquées, très apparentes des deux côtes, sa carène plus aiguë, et son ombilic moindre. *L'H. Bruneri* présente avec *L'H. Hemphilli*, à peu près les mêmes différences qu'avec *L'H. Cooperi*. Sauf les côtes spirales, cette coquille présente les plus grands rapports de forme avec *L'H.* (*Xerophila*) *filimargo*, de la Crimée. L'ombilic et la carène sont aussi presque identiques. (Ancey.)

Patula perspectiva, Say. (p. 164.)

A carinated form is found in Union Co., Tennessee.

Patula Bryanti, Harper. (p. 165.)

Plate I. Fig. C.

Shell broadly and perspectively umbilicate, discoidal, nearly flat above, and deeply excavated below ; whorls 5, gradually increasing, regularly ribbed, outer whorl bicarinate; color light-brown ; aperture small, rhomboidal ; peristome simple, acute, having its extremities united. Greater width, 6½ mm.; least, 5½ mm. ; height, 2 mm. ; width of umbilicus, 4½ mm. (Harper.)

Patula Bryanti, Harper, Journ. of Cincinnati Soc. Nat. Hist., Oct., 1881, p. 258, Figs. 1, 1 a.

Found deeply buried under old logs on Roan Mountain, Mitchell Co., North Carolina.

I have given the original description above, and figures of one of the original specimens kindly furnished by Prof. Harper.

It may prove a carinated variety of *perspectiva*, but apparently deserves to be designated by a specific name.

Patula striatella, Anthony. (p. 165.)

Said to be found in Kamtschatka and Northern China, distinct from *pauper*, by Möllendorff. J. B. Moll. Ges., VIII. 35.

Patula asteriscus, Morse. (p. 167.)

Tacoma, Washington Territory.

Microphysa Stearnsi, Bland.

Plate II. Figs. N, O.

Olympia, Washington Territory, and Portland, Oregon. (H. Hemphill.)

As shown above, from an examination of the jaw and lingual dentition, it appears that this species is not a *Zonites*, as orignally described, but rather a *Microphysa*, like *M. Lansingi* and *M. Ingersolli*. With the former it shares the peculiarity of having a ribbed jaw and aculeate marginal teeth to its lingual membrane.

The jaw has over 19 ribs of the same type as those of *M. Lansingi* (see Pl. II. Fig. O). A portion only of the jaw is figured.

The lingual membrane (Pl. II. Fig. N) has four laterals on each side of the central tooth.

Microphysa Ingersolli, Bland. (p. 173.)

Ogden, Utah.

Onchidella Carpenteri, W. G. Binney. (p. 179.)

Body oblong, extremities bluntly rounded: upper surface regularly arched; below, quite near the edge, the border of the mantle is readily distinguished; most of the under surface is occupied by the broad, distinct locomotive disk: the body is uniformly smoke-colored; the four specimens received vary from 5 to 3 mm. in length.

Onchidium Carpenteri, W. G. Binn., Proc. Phila. Ac. N. Sc., 1860, p. 154. Land & Fresh-W. Sh. N. A., Part I. p. 308, Fig. 545 (1869).

Unfortunately omitted from Vol. V. The locality, Cape San Lucas, is doubtful. It is so referred, probably by mistake, in the volume of Land and Fresh-water Shells of North America, quoted above. There is no jaw, which renders still more peculiar the presence of one in *O. borealis;* on this account, I place the genus in *Agnatha* in the catalogue offered with this. The dentition is as in *O. borealis* (see Vol. V.). The upper margin of the base of attachment is still more prolonged in this species.

Helicodiscus fimbriatus, Wetherby. (p. 186.)

Plate I. Fig. D.

Shell light green color, discoidal or planiform, widely umbilicate, consisting of about five whorls, very gradually increasing in size. Aperture lunate, and oblique to the axis of the shell. Peristome subacute, slightly thickened, and darker than the rest of the shell, the outline somewhat sinuous when viewed from the side of the whorl. Suture deeply and regularly impressed. Umbilicus exhibiting all the volutions. Whorls ornamented with from 6 to 8 revolving ridges, terminating in a fringe-like projection of the epidermis, following this arrangement. Two or three of these ridges on the upper side of the body whorl are often of such prominence as to give that portion of the shell a fluted appearance. In old shells these epidermal fringes are somewhat worn away, leaving the ridges upon which they stood. Greater diameter, 5 mm.; lesser, 4½ mm.; height, 1½ mm.

In some specimens as many as six teeth may be observed, none of which can be seen on the aperture. (Wetherby.)

Helicodiscus fimbriatus, WETHERBY, Journ. Cincinnati Soc. Nat. Hist., IV., Dec., 1881, p. 9.

Ocoee District, Eastern Tennessee.

The figure is drawn from one of Prof. Wetherby's specimens.

Ferussacia subcylindrica, LINN. (p. 187.)

To the synonymy add: —

Cionella (*Zua*) *Morseana*, DOHERTY, Quart. Journ. Conch., I. 342, Pl. IV. Fig. 2 (1878).

Pupa armifera, SAY. (p. 205.)

I am indebted to M. de St. Simon of Toulouse for a knowledge of the lingual dentition. There are 68 rows of 14–1–14 teeth, of which 7 on each side of the median line are laterals.

Pupa contracta, SAY. (p. 207.)

To the synonymy add: —

Pupa Cincinnatiensis, JUDGE, Quart. Journ. Conch., I. 343, Fig. (1878).

FOSSIL SPECIES OF PUPA. (p. 213.)

Add: —

Anthracopupa, WHITFIELD, Amer. Journ. Sc., [3,] 21, 126, cut.

Vertigo ovata, SAY. (p. 219.)

To the synonymy add: —

Zonites Upsoni, CALKINS, Valley Naturalist, St. Louis, Vol. II. No. 4, Dec., 1880, p. 53, Fig. Home and Science Gossip, Rockford, Illinois, March, 1881.

An examination of the lingual membrane alone would prove this to be a *Zonites*. Until then I retain it in *Vertigo*, as identical with or allied to *ovata*. I have, however, on Plate I. Fig. L, given a copy of one of the original figures, leaving out the striæ, which are exaggerated in the original, and here give the original description, from which the species may be recognized, should it prove a *Zonites*.

Shell conic, thin, transparent, shining, amber-colored, umbilicated; whorls $4\frac{1}{2}$, convex, very finely striated; striæ visible only under microscope. Suture distinct, aperture orbicular; peristome simple, acute, its outer termination perpendicular to the body whorl, the columellar termination reflected over the umbilicus. No internal teeth or process. Greater diameter, 1.35 mm.; lesser diameter, 1.20 mm.; length of axis, 1 mm. Locality, Winnebago Co., Illinois.

The animal not having been examined, I am unable to decide the generic character of the species with certainty; but judging from the shell I believe that it is a *Zonites*, and may be placed in the section *Conulus* of W. G. Binney's arrangement (Terr. Moll., Vol. V.). The shell resembles *A. harpa* in outline, but differs in other respects very materially. It is smaller; the texture of the shell is like that of *Conulus fulvus*. The striæ are visible only under the microscope. It is distinctly umbilicated, and the aperture is not oblique. It is no *Vertigo*. This shell, which is unlike any known *Helix*, was first discovered by Mr. Jesse B. Upson, in a damp meadow farm in Rockford, Illinois, beneath some refuse boards.

I have examined a large number of specimens under the microscope, and have made comparisons with many other species, both American and foreign, but have found none like it. There is no probability of its being an importation. The locality and surroundings forbid that.

I may mention that Messrs. Binney and Bland have examined the shell and agree that it is new. Such being the case, it is a matter of congratulation (though a surprise) to be able to add a new species to the American *Helices* from Illinois. I have the pleasure of naming the shell after the first discoverer, Mr. Upson. (Calkins.)

Mr. Upson suggests to me that the shell is the young of *V. ovata*, as it was found in company with mature specimens of that species.

Veronicella olivacea, Stearns. (p. 243.)

"Lobitos is a small creek entering the sea about forty miles south of San Francisco Bay. The ranch and hamlet through which it passes bear the same name." (Stearns.)

Specimens of the original lot found in Nicaragua have kindly been furnished me by Dr. F. W. Putnam. The jaw has over 20 ribs. The lingual membrane is as usual in the genus.

HEMPHILLIA. (p. 246.)

Plate III. Fig. II.

Animal limaciform, blunt before, swollen at centre, and greatly attenuated behind: tentacles simple: mantle subcentral, large, oval, concealing all but a small portion of an internal shell-plate: longitudinal furrows above the margin of the foot and caudal mucus-pore, over which is a hump-like process: no distinct locomotive disk: external respiratory and anal orifices at the central right margin of the mantle: orifice of combined genital system near the right eye-peduncle.

Shell-plate horny, small, unguiform, longer than wide, with posterior nucleus and concentric lines of growth, exposed in part.

Jaw ribbed.

Lingual membrane with tricuspid central teeth, bicuspid laterals, and quadrate marginals.

Coast of Oregon.

The swollen central portion of the animal seems the first approach to a turbinate mass of viscera, separated from the foot.

This emended generic description is drawn from larger specimens (10 mm. contracted in alcohol) collected at Portland, Oregon, by Mr. H. Hemphill. Found also at Tacoma, Puget Sound, and Olympia, Washington Territory, by the same collector.

Polygyra auriculata, Say. (p. 263.)

Cedar Keys: St. George's Island, Florida.

Polygyra Texasiana, Moricand. (p. 270.)

Fort Gibson, Indian Territory.

Polygyra Dorfeuilliana, Lea. (p. 278.)

Fort Gibson, Cherokee Nation, Indian Territory: Alexandria, Louisana.

Wetherby suggests the specific name of *Sampsoni* for the variety described in Vol. V.

Polygyra pustuloides, Bland. (p. 287.)

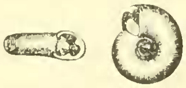
Lookout Mountain, Tennessee.

Polygyra leporina, Gould. (p. 288.)

Fort Gibson, Indian Territory.

Polygyra Harfordiana, J. G. Cooper. (p. 309.)

Fig. 203 is said by Dr. Cooper not to represent his species, but rather the Salmon River small form of *Mesodon devia* var. *Mullani*. I have, therefore, here given a figure of Dr. Cooper's original type of *D. Harfordiana* preserved at the Academy of Natural Sciences at Philadelphia. The species from this seems more nearly allied to *Polygyra* than to *Triodopsis*.



It must be remembered that my figure of the dentition (Pl. VIII Fig. B) and description of jaw were drawn from the Salmon River shell, not the typical shell found only in the Sierra Nevada region at "Big Trees."

Triodopsis vultuosa, Gould. (p. 312.)

Plate III. Fig. J.

There are 12 ribs on the jaw. The lingual membrane has 20–1–20 teeth, 11 laterals on each side of the median line.

For the variety called *Henriettæ*, see below.

Triodopsis Copei, Wetherby.

Plate I. Fig. J.

Shell reddish, somewhat thin, deeply striated by lines of growth, and of medium size. Spire somewhat depressed in some specimens, slightly more elevated in others. Whorls 5, transversely striated with oblique lines of growth, and increasing very gradually and regularly in size; a faint carina appearing at the junction of the upper third and lower two-thirds of the body whorl, from which the latter tapers inwardly to the base of the shell. Sutures regularly and moderately impressed. Peristome subacute, and broadly reflected outward and downward at the lower two-thirds, and bearing on its basal third an acute carina, within which is seen a prominent, vertical, double tooth, of which the outer portion is the larger. A second tooth is carried by the inner margin of the peristome at the centre of the body whorl, the point of which is in close relation to an arcuate tooth carried by the parietal wall of the aperture. Umbilicus wide, exhibiting most of the volutions. Height, 7 mm.; greater diameter, 14 mm. This size is about the average. (Wetherby.)

Helix Copei, Wetherby, Amer. Nat., Mar., 1877, p.

Twenty miles north of Beaumont, Harden Co., Texas.

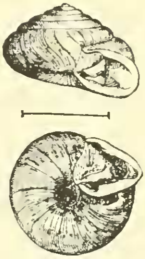
It is very like a large *vultuosa*, the aperture not produced beyond the teeth as in *Henriettæ*, but there is no trace of the callus connecting the parietal tooth with the angle of the peristome.

The figure on Plate I. is a fac-simile of that of Prof. Wetherby.

Triodopsis Henriettæ, Mazyck.

Treated as a var. of *T. vultuosa*, p. 313. Perhaps will prove distinct.

Shell rimately umbilicated, depressed, globose, rather solid, with numerous regular delicate striæ, dark brownish horn-color; spire obtuse; whorls about five and a half, slightly convex; suture deeply impressed; beneath convex,



smoother than above ; umbilicus very deep, reaching the apex, but only exhibiting the last three whorls, grooved within ; body whorl gently ascending just behind the aperture, and then suddenly and shortly deflected, very much constricted behind the peristome, with two deep exterior pits, having the space between them elevated into a prominent ridge ; aperture subtriangular, peristome much thickened within and very slightly reflexed, very tortuous, yellowish white, furnished with a small denticle near its upper termination and an erect lamelliform tooth, which is equal in length to about one fifth the diameter of the base of the shell, extending from the lower end of the uppermost pit almost to the inner edge of the body whorl ; low down in the mouth of the shell there is, between this tooth and the denticle, a large white tongue-shaped, concave tooth ; and very near this, but rather lower down in the mouth of the shell, and on the base of the body whorl, there is an oblique stout, white tooth, which is sometimes slightly cleft on the edge. The parietal wall, which is covered with a semi-transparent callus, bears a very strong, arcuated, entering, white tooth, whose outer margins form almost a right angle.

Diameter, major, $\frac{1}{2}$ inch ; minor, $\frac{1}{16}$ inch ; altitude, $\frac{1}{4}$ inch.

Eastern Texas. Mr. Jacob Boll.

This species more nearly resembles *Helix vultuosa*, Gould, than any other North American species, but differs from that shell in the shape and size of the umbilicus and in the form and armature of the aperture, which in *vultuosa* is lunate, almost circular, and in this species is rather V-shaped ; in *vultuosa* the peristome, though moderately so, is decidedly reflexed, and its plane is almost entirely unbroken ; in *Henriettæ* it is very much thickened, but scarcely at all reflexed, is very tortuous, and bears on its inner margin an obtuse denticle and a long lamelliform erect tooth, which are wanting in *vultuosa ;* in *Henriettæ* the two internal teeth are so far within the aperture as to be seen only on looking into it, while in *vultuosa* they are plainly visible from the base of the side ; in the latter the parietal tooth is arched *upwards*, and its outer margin is rounded ; in *Henriettæ* it takes the opposite direction, and its margins form almost a right angle ; the deep pits behind the peristome are wanting or obsolete in *vultuosa*. (Mazyck.) The species is referred to by Mr. Bland in his "Remarks," p. 116.

To the original description of Mazyck I add a figure drawn by Mr. Arthur F. Gray from the original specimen. As stated above, Mr. Bland and myself formerly considered this as a variety of *T. vultuosa*. It seems, however, quite as worthy of specific weight as *T. Copei*.

Triodopsis loricata, Gould. (p. 313.)

Mariposa Co., California.

Triodopsis Levettei, Bland. (p. 314.)

Plate I. Fig. E.

Shell umbilicate, orbiculate-convex, thin, shining, translucent, slightly and irregularly obliquely striated, chestnut-colored, the upper whorls paler ; spire scarcely elevated, apex obtuse ; suture impressed ; whorls 7, rather convex, gradually increasing ; the last somewhat depressed at the aperture, obsoletely spirally striated, constricted behind the aperture, and slightly scrobiculated, base subconvex ; umbilicus moderate, $\frac{1}{8}$ diameter of the shell, pervious ; aperture very oblique, subcircular, with a well-developed flexuose, transverse white tooth on the parietal wall ; peristome reflected, pale chestnut-colored, thickened within, the margins joined by a slight callus, the right margin with a white, obtuse, erect, submarginal tooth, the basal margin with two white transverse teeth, the upper one the larger.

Triodopsis Levettei, Bland, Ann. N. Y. Acad. Sci., Vol. II. No. 4, p. 116, Fig. (1880).

Near Santa Fé, New Mexico, where two living and one dead specimen were collected by my friend, Dr. G. M. Levette, who presented to me one of the former. Cabinet of Dr. Levette, and the Binney and Bland collection in the American Museum of Natural History, New York.

This species is quite distinct from any known North American or other form. The number of whorls, and of teeth, their form and color, with the color of the shell and peristome, are its peculiar features. The striæ are by no means so well developed as shown in the figures. (Bland.)

The figures are copied on my plate.

Von Martens suggests that the species may be a *Polygyra.*

Mesodon. (p. 314.)

All the specific names should have the masculine termination.

Mesodon Andrewsi, W. G. Binn. (p. 324.)

Plate II. Fig. L. Plate III. Fig. E, F.

Shell imperforate, globose, very thin, with delicate wrinkles of growth and microscopic revolving striæ ; horn-color ; spire elevated, conic, apex obtuse ; whorls six, convex, the last greatly swollen ; peristome white, thickened, slightly reflected, ends separated, the columellar one expanded. Greater diameter, 25 mm. ; lesser, 20 mm. ; height, 14 mm.

Mesodon Andrewsi, W. G. Binn., Ann. N. Y. Acad. Sci., Vol. I. p. 360, Pl. XIV. Fig. E, F, Pl. XV. (1879).

Roan Mountain, Mitchell Co., North Carolina. Mrs. G. Andrews. The absence of limestone on Roan Mountain accounts for the extreme thinness of the shell.

It can scarcely be said to resemble closely any known species of *Mesodon*, though perhaps somewhat like a gigantic *M. Mitchellianus.*

The jaw has sixteen ribs.

The lingual membrane (Pl. III. Fig. F) is long and narrow ; teeth 64–1–64, with about 15 perfect laterals on either side of the central line. There are no side cusps or cutting points to the central and lateral teeth, and only on the extreme marginals does a side cutting point appear. The cutting point of the marginals is long. Thus the dentition is like that of *clausus* and *thyroides.*

The genitalia are figured on Plate III. Fig. E. The genital bladder (*g. b.*) is large, oval, on a short, narrow duct : the penis-sac (*p. s.*) is long and stout, with a subcentral constriction : the prostate gland (*pr.*) is highly developed.

A dentate form is figured on Plate IV. Fig. A.

Mesodon Wheatleyi, Bland. (p. 327.)

Roan Mountain, Mitchell Co., North Carolina ; Cliff Springs, Monroe Co., Tennessee. Mrs. G. Andrews. The parietal tooth was wanting in these specimens.

Mesodon dentiferus, Binney. (p. 328.)

Plate III. Fig. G.

On Plate III. Fig. G, I have figured the genitalia of this species.

The genital bladder (*g. b.*) is small, oval, on a short duct, which is greatly swollen at a short distance below the bladder : the penis-sac (*p. s.*) is long, stout, and contracted at a short distance below its blunt end ; the retractor is inserted in the vas deferens at about the middle of its length.

In another individual, the constriction of the penis-sac was not so well developed.

Mrs. G. Andrews found at Sugar-Loaf Mountain, North Carolina, twenty miles east of Roan Mountain, a specimen of 5½ whorls ; greater diameter, 30 mm. ; lesser, 25 mm. ; height, 12 mm.

Mesodon Wetherbyi, Bland. (p. 330.)

Roan Mountain, Mitchell Co., North Carolina ; Campbell Co., Tennessee, Mrs. G. Andrews. Animal uniform slate-color.

Mesodon clausus, Say. (p. 332.)

Helix Ingallsiana. See Fischer, in Shuttleworth's Notitiæ Mal., II. 10, Pl. III. Fig. 5 (1877).

Mesodon Lawi, Lewis. (p. 335.)

Monroe Co., East Tennessee. Mrs. G. Andrews. Houston Co., Georgia.

Mesodon devius, Gould. (pp. 337, 432.)

Plate III. Fig. I.

The genitalia are here figured.

The typical form was found by Mr. H. Hemphill, at Freeport, Cowlitz Co., Washington Territory.

Mesodon Sayii, Binney. (p 339.)

Plate I. Fig. A, B. Plate II. Fig. K.

An opportunity of examining the animal of this large form of *M. Sayii*, for which I am indebted to Dr. Lewis, shows that the genital system (Pl. I. Fig. B) is similar to that of the typical form, excepting that the penis-sac is still more developed, surpassing by three times the whole genital system in length. (See Vol. I., Pl. XI. Fig. 11.)

The jaw and lingual dentition are the same as in the typical *Sayii*. I have figured on Plate I. Fig. A, the dentition of this variety.

In the mountains of Tennessee and North Carolina is found the form called *var. Chiloweensis*, one of which is figured in the plate referred to (Pl. I. Fig. K).

Aglaia fidelis, Gray. (p. 350.)

The small form from Mount Shasta, mentioned on p. 351, which also is found at the Dalles, has the same dentition and genitalia as the typical form. (See Pl. IV. Fig. G.)

There is a black variety from northern parts of California still more nearly allied to *infumata*.

Aglaia infumata, Gould. (p. 352.)

The animal is black with brick-red tubercles. Latitude 37° 30′ is said to be its southern limit. Its shell is sometimes banded. Plate IV. Fig. B, C, represent the species denuded of its hairs.

Aglaia Hillebrandi, Newcomb. (p. 352.)

Calaveras Co., California.

Arionta. (p. 353.)

The species are not well grouped in the text. The following is more natural: —

Arionta arrosa.
Townsendiana.
exarata.
*
Californiensis (including *reticulata Nickliniana, ramentosa, Bridgesi*)
*
intercisa (including *redimita*).
*
Ayersiana.
*
tudiculata.
*

Arionta Mormonum Traski.
Carpenteri.
sequoicola.
Diabloensis.
*
Dupetithouarsi.
*
ruficincta.
Gabbi.
*
Kelletti.
Stearnsiana.

The geographical distribution of the species is very peculiar. *A. Townsendiana* belongs to the Oregon fauna. I doubt its ever having been found in Tuolumne Co., California. *A. Mormonum* belongs to the Sierra Nevada counties, as does *A. tudiculata*, which also is found in southern coast counties. All the others are restricted to the coast counties, ranging as stated in the text, the following being island species: *A. ruficincta, Gabbi, intercisa, Ayersiana,* and *Kelletti. A. Stearnsiana* and *Carpenteri* are Lower Californian species.

The lingual dentition of all the species is essentially the same, excepting *Townsendiana* and *ruficincta,* which have tricuspid centrals and inner laterals. The genitalia are the same in *arrosa, exarata, Nickliniana, Californiensis, Ayersiana, tudiculata, Traski, Carpenteri, sequoicola, Diabloensis,* and *Dupetithouarsi.* From these the genitalia of *Mormonum* differ very essentially, being more nearly allied to that of *Aglaia fidelis* and *infumata. A. Townsendiana* has simple genitalia, without the accessory organs usually found in *Arionta. A. Kelletti* and *Stearnsiana* have the organs still more complicated with accessories. *A. ruficincta* and *Gabbi* are related by their genitalia to the last, but differ considerably in wanting the accessory duct of genital bladder.

I have not examined the genitalia of *intercisa.*

Arionta arrosa, Gould. (p. 354.)

J. G. Cooper, in Proc. Cal. Ac. N. S., 1875, p. 16, indicates a variety, *Holderiana*, and another variety, *Stiversiana.*

Arionta Townsendiana, Lea. (p. 355.)

The variety *ptychophora* is sometimes very thin and smooth, not malleated. I have it from Salmon River, Idaho; Bitter Root Mountains; Dalles, Oregon; Umatilla Co., Oregon. (Hemphill.) (See Pl. IV. Fig. E, F.)

Arionta tudiculata, Binney. (p. 357.)

In the Sierra Nevada from San Diego it ranges 450 miles north. J. G. Cooper says this and *A. Mormonum* are the only large species found east of the coast range.

Dr. Cooper mentions a variety, *Franki*, in Amer. Journ. Conch., V. 209. In letters to me, however, he says this is a misprint for *Traski*.

Arionta Ayersiana, Newcomb. (p. 359.)

San Clemente Island. (Yates.)

Arionta intercisa, W. G. Binney. (p. 360.)

Plate I. Fig. I.

Mr. Henry Hemphill has lately sent me alcoholic specimens, collected by him at San Clemente Island, California.

The jaw is as usual in the genus, with six separated ribs.

The lingual membrane is as usual in the genus. Teeth 31–1–31, with about 15 laterals on each side. The extreme laterals only are bicuspid. (Pl. I. Fig. I.)

The genitalia are like those figured by me for *Euparypha Tryoni*. (See Terr. Moll., V.)

From the series of specimens sent by Mr. Hemphill, I am inclined to believe *Arionta redimita* to be a variety of *intercisa*. The original specimen may have come from the same locality. Formerly I suspected *redimita* to be a variety of *ramentosa*.

Arionta Mormonum, Pfeiffer. (p. 366.)

Pl. I. Fig. K.

The small form from Dalles, Oregon, is probably a small variety of *Aglaia fidelis*. Sonora, Mexico, is given as a locality of this species, from confounding the *town* Sonora of Tuolumne Co., California, with the Mexican *state*. Mormon Island is a rocky islet in the American River, seventy miles north-northwest of this town of Sonora.

A variety is indicated as *circumcarinata* by Stearns (Ann. N. Y. Acad. Sci., Vol. I. p. , Fig., 1879). A copy of two of his figures is given on Plate I. Fig. K. It is thus described by him

Shell widely umbilicated, discoidal, flattened, angulated, with a peripheral keel; whorls six to six and a half, slightly tabulated near the sutures, which latter are deeply impressed; surface finely granulated, varying in different specimens; and otherwise sculptured by conspicuous subacute ribs parallel with the lines of growth both above and below, which meet, and sometimes cross, the peripheral keel; these ribs are more or less irregular and uneven, of varying prominence, and are also unequally spaced, being closely crowded in some places and farther apart in others. Aperture obliquely subangulate, semilunate; peristome moderately thickened, reflected somewhat, covering the open umbilicus, and made continuous by a connecting thin deposit of callus on the labium. Color, in some specimens, dingy white to white, in others a dingy reddish white, ornamented with a double revolving band, — the upper stripe being whitish, the lower reddish or light chestnut just above, and contiguous to the peripheral keel; the pinch or fold of the keel taking up what in *Helix Mormonum* is the third or lower stripe of white.

Number of specimens four, two adult and two immature, but nearly full grown.

Greater diameter, .92 to 1.01 inches; lesser diameter, .75 to .86 inch; height, .36 to .37 inch.

Animal not observed.

Stanislaus County, near Turloch, California. (Stearns).

The form to me appears a distinct species.

Arionta Diabloensis, J. G. Cooper. (p. 369.)

The species ranges one hundred miles north of Mt. Diablo. (Cooper.)

Arionta Traski, Newcomb. (p. 369.)

Dr. Cooper gives its ranges from Los Angeles fifty miles to Fort Tejon, and one hundred and fifty miles to San Luis Obispo. He says the first four whorls are hirsute.

Arionta Dupetithouarsi, Desh. (p. 370.)

In the grove at Cypress Point, Monterey.

Glyptostoma Newberryanum. (p. 374.)

The under surface of a large specimen is figured on Plate IV. Fig. D.

Macroceramus Kieneri, Pfeiffer. (p 385.)

Mr. Bland (Ann. N. Y. Acad. Sci., Vol. II. p. 127) has shown the United States specimens to be distinct under the name of *pontificus*, Gould.

Bulimulus Schiedeanus, Pfeiffer. (p. 391.)

Plate III. Fig. K.

Jaw slightly arcuate, ends scarcely attenuated, blunt ; anterior surface with 17 ribs, denticulating either margin. It is difficult to decide the exact character of these ribs. I have usually called the ribs in *Bulimulus*, *Cylindrella*, etc. narrow and widely separated. They should perhaps be described as very broad, with narrow interstices, and with a gradual increase of thickness towards their outer longitudinal margin. This plainly thickened margin is what I have formerly described as narrow ribs. In the jaw before me there is no tendency to oblique arrangement of the ribs at the upper central portion.

The lingual membrane (see plate) is long and narrow. Teeth of the same type as described by me under *Bul. dealbatus*, Say, in Vol. V.

Bulimulus multilineatus, Say. (p. 395.)

Mexico (Fischer and Crosse).

Orthalicus undatus, Brug. (p. 408.)

The upper figure of Plate LIV. is referred by Von Martens to *O. Ferussaci.*

Succinea ovalis, Gould. (p. 417.)

To the synonymy add : —

S. Calumetensis, Calkins, Valley Naturalist, Vol. I. No. 2, p. 1, with a figure. St Louis.

Spurious Species of Helicidæ. (p. 431.)

Clausilia acrolepia, " L'Amérique Russe" is a typographical error for " L'Arménie Russe." Zoöl. Rec., 1881.

In the following list I have incorporated all the foregoing additions and alterations.

CATALOGUE

OF THE

TERRESTRIAL AIR-BREATHING MOLLUSKS

OF THE UNITED STATES AND ADJACENT TERRITORIES OF NORTH AMERICA.

PULMONATA GEOPHILA.

Agnatha.

Glandina Vanuxemensis, Lea.
truncata, Gmel.
decussata, Desh.
Glandina bullata, Gld.
Texasiana, Pfr.

Holognatha Vitrinea.

Macrocyclis Vancouverensis, Lea.
sportella, Gld.
concava, Say.
Hemphilli, W. G. Binn.
Voyana, Newc.
Duranti, Newc.
Zonites *Mesomphix.*
capnodes, W. G. Binn.
fuliginosus, Griff.
friabilis, W. G. Binn.
Rugeli, W. G. Binn.
caducus, Pfr.
lævigatus, Pfr.
demissus, Binn.
ligerus, Say.
intertextus, Binn.
subplanus, Binn.
inornatus, Say.
sculptilis, Bland.
Elliotti, Redf.
cerinoideus, Anth.
Hyalina.
cellarius, Müll.
Whitneyi, Newc.
nitidus, Müll.
arboreus, Say.
Zonites viridulus, Mke.
indentatus, Say.
petrophilus, Bland.
Wheatleyi, Bland.
limatulus, Ward.
minusculus, Binn.
milium, Morse.
Binneyanus, Morse.
ferreus, Morse.
conspectus, Bland.
exiguus, Stimpson.
chersinellus, Dall.
capsella, Gld.
placentula, Shuttl.
Lawi, W. G. Binn.
Conulus.
fulvus, Drap.
Fabricii, Beck.
Gundlachi, Pfr.
Gastrodonta.
gularis, Say.
cuspidatus, Lewis.
suppressus, Say.
lasmodon, Phillips.
macilentus, Shuttl.
significans, Bland.

Zonites Andrewsi, W. G. Binn.
internus, Say.
multidentatus, Binn.
Vitrinozonites latissimus, Lewis.
Vitrina limpida, Gould.
Angelicæ, Beck.
Pfeifferi, Newc.
Vitrina exilis, Morelet.
Limax maximus, L.
flavus, L.
agrestis, L.
campestris, Binn.
Hewstoni, J. G. Cooper.
montanus, Ingersoll.

Holognatha Helicea.

Patula solitaria, Say.
strigosa, Gld.
Hemphilli, Newc.
Idahoensis, Newc.
alternata, Say.
Cumberlandiana, Lea.
perspectiva, Say.
Bryanti, Harper.
striatella, Anth.
pauper, Gld.
Horni, Gabb.
asteriscus, Morse.
Microphysa incrustata, Poey.
vortex, Pfr.
Lansingi, Bland.
Ingersolli, Bland.
Stearnsi, Bland.
Hemitrochus varians, Mke.
Holospira Roemeri, Pfr.
Goldfussi, Mke.
Onchidella borealis, Dall.
Carpenteri, W. G. Binn.
Tebennophorus Caroliniensis, Bosc.
Helicodiscus lineatus, Say.
fimbriatus, Weth.
Ferussacia subcylindrica, L.
Cæcilianella acicula, Müll.
Stenogyra *Rumina.*
decollata, L.
Opeas.
octonoides, C. B. Ad.
subula, Pfr.
Melaniella.
gracillima, Pfr.
Pupa *Pupilla.*
muscorum, L.
Blandi, Morse.
Hoppii, Möll.
variolosa, Gld.
pentodon, Say.
decora, Gld.
corpulenta, Morse.
Rowelli, Newc.
Californica, Rowell.
Leucochila.
fallax, Say.
modica, Gld.
Arizonensis, Gabb.
hordeacea, Gabb.
armifera, Say.
contracta, Say.
rupicola, Say.
corticaria, Say.
pellucida, Pfr.
borealis, Morelet.
alticola, Ingersoll.
Vertigo Gouldi, Binn.
Bollesiana, Morse.
milium, Gld.
ovata, Say.
ventricosa, Morse.
simplex, Gld.
Strophia incana, Binn.

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Arion fuscus, Müll.
foliolatus, Gld.
Ariolimax Columbianus, Gld.
Californicus, J. G. Coop.

- Ariolimax niger, J. G. Coop.
  - Hemphilli, W. G. Binn.
  - Andersoni, J. G. Coop.
- Prophysaon Hemphilli, Bland & Binn.
- Veronicella Floridana, Binn.
  - olivacea, Stearns.
- Binneya notabilis, J. G. Coop.
- Hemphillia glandulosa, Bland & Binn.
- Pallifera dorsalis, Binn.
  - Wetherbyi, W. G. Binn.
- Strobila labyrinthica, Say.
  - Hubbardi, A. D. Brown.
- Gonostoma Yatesi, J. G. Coop.
- Polygyra auriculata, Say.
  - uvulifera, Shuttl.
  - auriformis, Bland.
  - Postelliana, Bland.
  - espiloca, Ravenel.
  - avara, Say.
  - ventrosula, Pfr.
  - Hindsi, Pfr.
  - Texasiana, Moricand.
  - triodontoides, Bland.
  - Mooreana, W. G. Binn.
  - hippocrepis, Pfr.
  - fastigans, L. W. Say.
  - Jacksoni, Bland.
  - Troostiana, Lea.
  - Hazardi, Bland.
  - oppilata, Moricand.
  - Dorfeuilliana, Lea.
  - Ariadnæ, Pfr.
  - septemvolva, Say.
  - cereolus, Muhlf.
  - Carpenteriana, Bland.
  - Febigeri, Bland.
  - pustula, Fer.
  - pustuloides, Bland.
  - leporina, Gld.
  - Harfordiana, J. G. Coop.
- Polygyrella polygyrella, Bland & J. G. Coop.
- Stenotrema spinosum, Lea.
  - labrosum, Bland.
  - Edgarianum, Lea.
- Stenotrema Edvardsi, Bland.
  - barbigerum, Redfield.
  - stenotremum, Fer.
  - hirsutum, Say.
  - maxillatum, Gld.
  - monodon, Rack.
  - germanum, Gld.
- Triodopsis palliata, Say.
  - obstricta, Say.
  - appressa, Say.
  - inflecta, Say.
  - Rugeli, Shuttl.
  - tridentata, Say.
  - fallax, Say.
  - introferens, Bland.
  - Hopetonensis, Shuttl.
  - Van Nostrandi, Bland.
  - vultuosa, Gld.
  - Copei, Weth.
  - loricata, Gld.
  - Levettei, Bld.
- Mesodon major, Binn.
  - albolabris, Say.
  - divestus, Gld.
  - multilineatus, Say.
  - Pennsylvanicus, Green.
  - Mitchellianus, Lea.
  - elevatus, Say.
  - Clarki, Lea.
  - Christyi, Bland.
  - exoletus, Binn.
  - Wheatleyi, Bland.
  - dentiferus, Binn.
  - Roemeri, Pfr.
  - Wetherbyi, Bland.
  - thyroides, Say.
  - Andrewsi, W. G. Binn.
  - clausus, Say.
  - Columbianus, Lea.
  - Downieanus, Bland.
  - Lawi, Lewis.
  - jejunus, Say
  - Mobilianus, Lea.
  - devius, Gld.
  - profundus, Say.

- Mesodon Sayii, Binn.
- Acanthinula harpa, Say.
- Vallonia pulchella, Müll.
- Fruticicola hispida, L.
  - rufescens, Penn.
- Dorcasia Berlandieriana, Moric.
  - griseola, Pfr.
- Turricula terrestris, Chemn.
- Aglaia fidelis, Gray.
  - infumata, Gld.
  - Hillebrandi, Newc.
- Arionta arrosa, Gld.
  - Townsendiana, Lea.
    - var. *ptychophora*, A. D. Brown.
  - exarata, Pfr.
  - Californiensis, Lea.
  - intercisa, W. G. Binn.
  - Ayresiana, Newc.
  - tudiculata, Binn.
  - Mormonum, Pfr.
    - var. *circumcarinata.*
  - Traski, Newc.
  - Carpenteri, Newc.
  - sequoicola, J. G. Coop.
- Arionta Diabloensis, J. G. Coop.
  - Dupetithouarsi, Desh.
  - ruficincta, Newc.
  - Gabbi, Newc.
  - Kelletti, Fbs.
  - Stearnsiana, Gabb.
- Glyptostoma Newberryanum, W. G. B.
- Euparypha Tryoni, Newc.
- Tachea hortensis, Müll.
- Pomatia aspersa, Müll.

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- Cylindrella Poeyana, D'Orb.
  - jejuna, Gld.
- Macroceramus pontificus, Gld.
  - Gossei, Pfr.
- Bulimulus patriarcha, W. G. Binn.
  - alternatus, Say.
  - Schiedeanus, Pfr.
  - dealbatus, Say.
  - serperastrus, Say.
  - multilineatus, Say.
  - Dormani, W. G. Binn.
  - Marielinus, Poey.
  - Floridanus, Pfr.

Goniognatha.

- Liguus fasciatus, Müll.
- Orthalicus undatus, Brug.
- Punctum pygmæum, Dr.

Elasmognatha.

- Succinea Haydeni, W. G. Binn.
  - retusa, Lea.
  - Sillimani, Bland.
  - ovalis, Gld., not Say.
  - Higginsi, Bland.
  - Concordialis, Gld.
  - luteola, Gld.
  - lineata, W. G. Binn.
  - avara, Say.
  - Stretchiana, Bland.
  - Verrilli, Bland.
  - aurea, Lea.
  - Groenlandica, Beck.
  - obliqua, Say.
- Succinea Totteniana, Lea.
  - campestris, Say.
  - Hawkinsi, Baird.
  - rusticana, Gld.
  - Nuttalliana, Lea.
  - Oregonensis, Lea
  - effusa, Shuttl.
  - Salleana, Pfr.

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  - Haleana, Lea.
  - Mooresiana, Lea.
  - Grosvenori, Lea.
  - Wilsoni, Lea.

EXPLANATION OF THE PLATES.

The figures of shells were drawn by Mr. Arthur F. Gray; those of genitalia and lingual dentition, by W. G. Binney.

PLATE I.

Fig. A. Mesodon Chiloweensis : lingual dentition.
" B. " " genitalia.
" C. Patula Bryanti.
" D. Helicodiscus fimbriatus.
" E. Triodopsis Levettei.
" F. Zonites petrophilus.
" G. " Wheatleyi.
" H. Vitrinozonites latissimus : lingual dentition.
" I. Arionta intercisa : lingual dentition.
" J. Triodopsis Copei.
" K. Arionta Mormonum, *var.* circumcarinata.
" L. Zonites Upsoni.

PLATE II.

Fig. A. Zonites placentula.
" B. " macilentus.
" C. " cuspidatus.
" D. " Andrewsi.
" E. " Lawi.
" F. " multidentatus.
" G. " significans.
" H. " Rugeli : shell.
" I. " " dentition.
" J. " subplanus : dentition.
" K. Mesodon Chiloweensis.
" L. " Andrewsi.
" M. Macrocyclis Hemphilli.
" N. Microphysa Stearnsi : dentition.
" O. " " jaw.

PLATE III.

Fig. A. Animal of Vitrinozonites latissimus: drawn by Miss Emma Pringle.
" B. Genitalia of same.
" C. " Zonites capnodes.
" D. " " Rugeli.
" E. " Mesodon Andrewsi.
" F. Dentition of " "
" G. Genitalia of Mesodon dentiferus.
" H. Animal of Hemphillia contracted in spirits.
" I. Genitalia of Mesodon devius.
" J. Dentition of Triodopsis vultuosa.
" K. " Bulimulus Schiedeanus.
" L. " Zonites Whitneyi.

PLATE IV.

Fig. A. Mesodon Andrewsi, *var.*
" B, C. Aglaia infumata, denuded of hairs.
" D. Glyptostoma Newberryanum.
" E. Arionta Townsendiana, *var.* ptychophora.
" F. " " *var.*
" G. Fac-simile of original figures of Hyalina subrupicola.
" H, I. Aglaia fidelis, *var.*

All but B, C, and H, I, photographed from nature.